Micronet
Faster and Easier Networks

User's Manual

11N ADSL2+ Modem Router

Model No.: SP3367N

http://www.micronet.info

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Certifications

FCC

This equipment has been tested and found to comply with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received. Include interference that may cause undesired operation.

CE

This equipment is in compliance with the requirements of the following regulations:
EN 55 022: CLASS B.

RoHS

All contents of this package, including products, packing materials and documentation comply with RoHS.

CE FC

Chapter 1   Introduction

Micronet SP3367N, 11N ADSL2+ Modem Router, delivers highly reliable and scalable network environment. The model has incorporated both modem and router functions into a single unit with wireless support. It is compliant with IEEE 802.11 Draft-N and backward compatible with IEEE 802.11b/g. The wireless connection can be optimized up to high-speed data rate of 300Mbps for multimedia applications. The modem router allows multiple network devices to share the single Internet connection via ADSL. Sustain network security via router's in-built firewall and DMZ functions.

1.1   Package Contents

Prior to the installation of the device, please verify the following items are in the package:

- 1 x SP3367N 11N ADSL2+ Modem Router
- 3 x Detachable Dipole Antenna
- 1 x Quick Installation Guide
- 1 x Product CD
- 1 x RJ-45 & RJ-11 Cables
- 1 x Power Adapter

1.2   Key Features

- ADSL2/2+ Compliance
  - ➢ Support downstream rates of up to 24Mbps and upstream rates of up to 1Mbps.
  - ➢ Compliant to ITU-T G.992.1 (G.dmt), G.992.2 (G.lite), G.992.3 (ADSL2), G.992.4 (splitterless ADSL2), G.992.5 (ADSL2+) for Annex A, B. (Annex A and B are supported in different H/W platform)
  - ➢ Supports Multi-Mode standard (ANSI T1.413, Issue 2; G.dmt (G.992.1); G.994.1 and G.996.1 (for ISDN only); G.991.1;G.lite (G992.2)).
  - ➢ Multiple Protocols over AAL5 (RFC 1483/2684).

- ➢ PPP over AAL5 (RFC 2364).
- ➢ PPP over Ethernet (RFC 2516).
- Support 802.11n Wireless Access Point
  - ➢ Complies with IEEE 802.11n draft 2.0, IEEE 802.11g and IEEE 802.11b standards.
  - ➢ Farther coverage, less dead spaces and higher throughput with MIMO technology.
  - ➢ High data rate – up to 300Mbps network speed.
  - ➢ Supports 64-bit/128-bit WEP, WPA-PSK and WPA2-PSK wireless security functions.
  - ➢ Supports WPS (WiFi Protected Setup) to easy connect wireless network without configuring the security.
  - ➢ Support Auto Channel Selection.
  - ➢ Supports MAC address filtering.
- Router Advance Functions
  - ➢ NAT (Network Address Translation) IP Sharing
  - ➢ Virtual Server
  - ➢ DMZ
  - ➢ VPN Pass Through (IPSec/PPTP/L2TP)
  - ➢ SPI Anti-DOS Firewall
  - ➢ DHCP Server and Client
  - ➢ ACL (Access Control)
  - ➢ IP/MAC/Application/URL Filter
  - ➢ UPnP (Universal Plug and Play)
  - ➢ SNMP
  - ➢ Dynamic DNS

1.3   Safety Information

In order to keep the safety of users, please follow the following safety instructions:

- This router is designed for indoor use only.
- Do not put this router at or near hot or humid places. Also, do not leave this router in the car in summer.
- Do not pull any connected cable with force and disconnect it from the router.

- If users want to place this router at high places, please make sure the router is firmly secured. Falling from high places would damage the router and its accessories, and in such cases, the warranty will be void.
- Accessories of this router, like antenna and power supply, are danger to small children under 3 years old. They may put the small parts in their nose or month and it could cause serious damage to them.
- The router will become hot when being used for long time (This is normal and is not a malfunction). Do not put this router on paper, cloth or other flammable materials.
- There's no user-serviceable part inside the router. If users found the router is not working properly, please contact the authorized dealer of purchase. Do not disassemble the router, otherwise warranty will be void.
- If the router falls into water when it's powered on, do not use hands to pick it up. Switch the electrical power off before doing anything, or contact an experienced technician for help.
- If users smell something strange, or even see some smoke coming out from the router or power supply, remove the power supply or switch the electrical power off immediately, and call authorized for help.
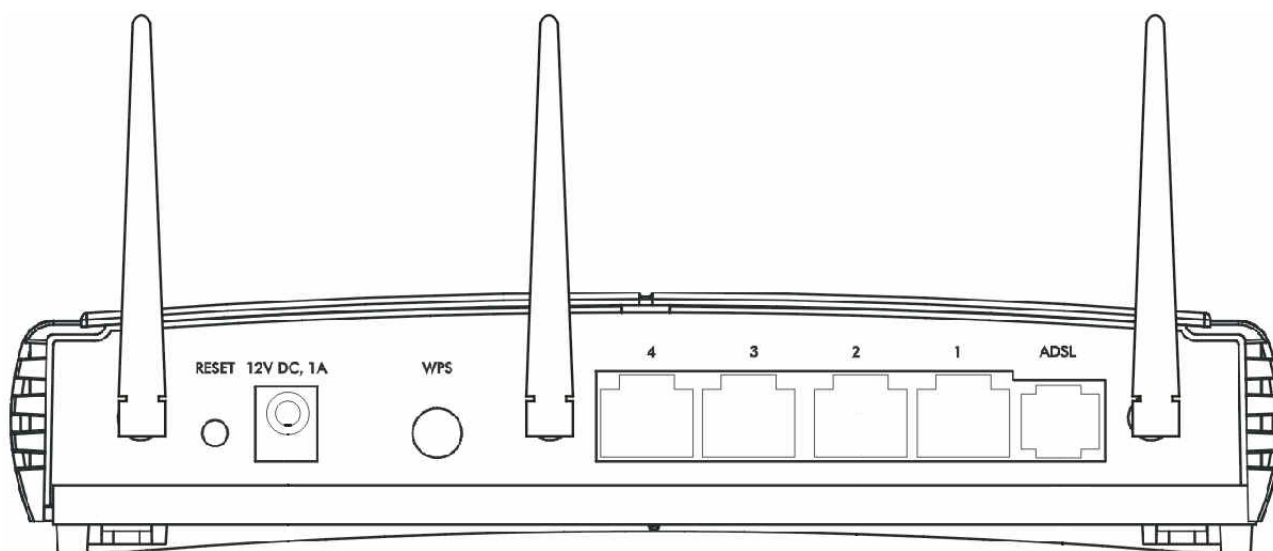
1.4 Specifications

Standards	• ADSL
	   ➢ ITU-T G.992.1 (G.dmt), G.992.2 (G.lite), G.992.3 (ADSL2), G.992.4 (splitterless ADSL2), G.992.5 (ADSL2+) for Annex A, B.
	   ➢ Multi-Mode standard (ANSI T1.413, Issue 2; G.dmt (G.992.1); G.994.1 and G.996.1 (for ISDN only); G.991.1;G.lite (G992.2))
	• Wireless
	   ➢ IEEE802.11n Draft
	   ➢ IEEE802.11b/g

Memory	• Flash: 2MB NOR Flash • RAM: 8MB SDRAM
Interface	• 4 x 10/100M UTP Ports • 1 x ADSL RJ-11 Port
Antenna	3 x RP-SMA Antenna
MIMO Technology	2T3R
Transmit Power	• 11n: 15dBm • 11g: 15dBm • 11b: 18dBm
DHCP	DHCP Server and Client
Advance Features	• NAT (Network Address Translation)/ NAPT IP

	Sharing • Virtual Server • DMZ • VPN Pass Through (IPSec/PPTP) • SPI Anti-DOS Firewall • ACL (Access Control) • IP/MAC/Application/URL Filter • UPnP (Universal Plug and Play) • Dynamic DNS
Security Features	• 64/128-bit WEP • WPA-PSK • WPA2-PSK
Management	• Web UI • SNMP
Humidity	10~90% (Non-Condensing)
Temperature	10~40℃
Power	12VDC, 1A Switch Power Adaptor
Certification	FCC, CE

Chapter 2   Physical Description

2.1   Back Panel

| Parameter	Description
Antenna Connector	The antenna connector of the router is reverse SMA connector. It allows you to connecting an external antenna with reverse SMA connector to the router easily.
Reset	Press and hold **<Reset>** button for 5 seconds to clear all settings.
Power Jack	Please plug the power adapter attached with the ADSL Router to the power jack. The power adapter is 12VDC, 1A.
WPS	Wi-Fi Protected Setup (WPS) is the simplest way to build connection between wireless network clients and this ADSL router. Press this button on the router and enable WPS function of the wireless clients, the router and clients will automatically configure the security key and connect directly. Please note that the router will wait for WPS requests from wireless clients in 2 minutes after the WPS button is pressed.
LAN	The Broadband router's 4 LAN ports are where users can connect LAN's PCs, printer servers, hubs and switches etc.
ADSL	Connect the supplied RJ-11 telephone line to this port and your ADSL/telephone network.

2.2 Front Panel
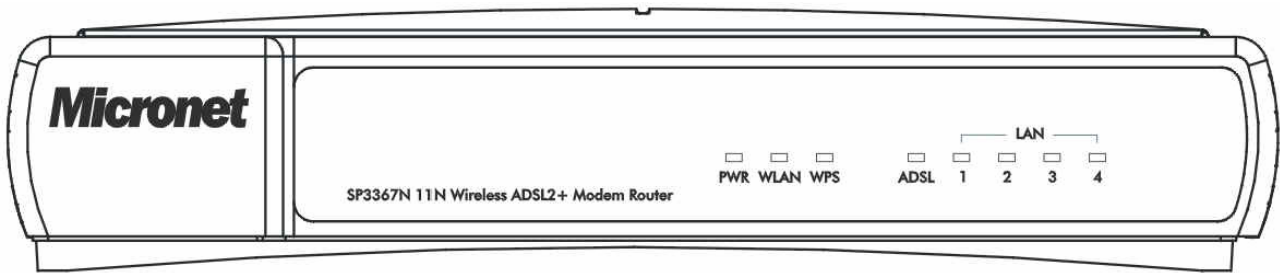
LED	Status	Description
PWR	On	Device is switched on.
WLAN	Off	Wireless LAN disabled.
	Blinking	Wireless transmission detected.
WPS	Off	WPS function is disabled.
	Blinking	WPS function is enabled.
ADSL	On	Successful connection to DSLAM.
	Blinking	No connection.
LAN (1-4)	On	LAN port is connected.
	Off	No network connection.
	Blinking	Data is being sent or received.

# Chapter 3   System and Network Setup

3.1   Build Network Connection

Please follow the following instruction to build the network connection between the new wireless router and other network computers and devices:
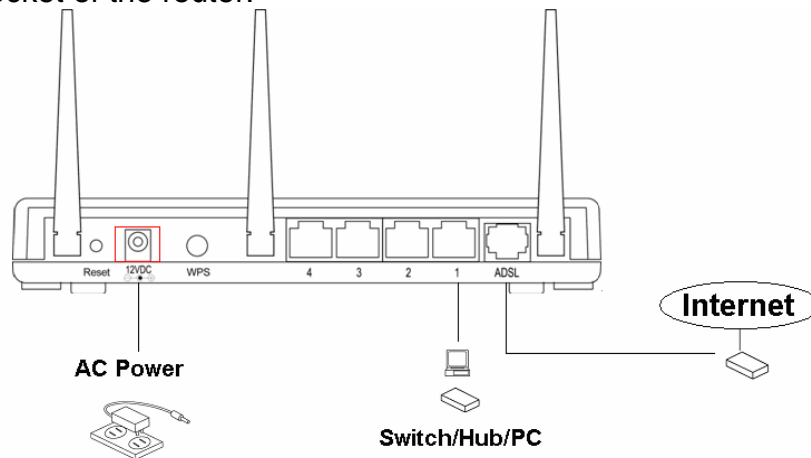
1. Connect the ADSL port of modem router by telephone cable (RJ-11) to an outlet or splitter.
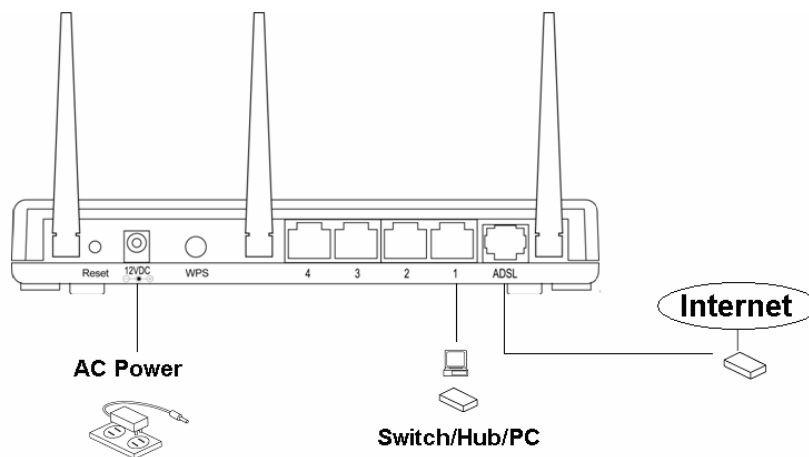
2. Connect all computers, network devices (network-enabled consumer devices other than computers, like game console, or switch / hub) to the LAN port of the router.
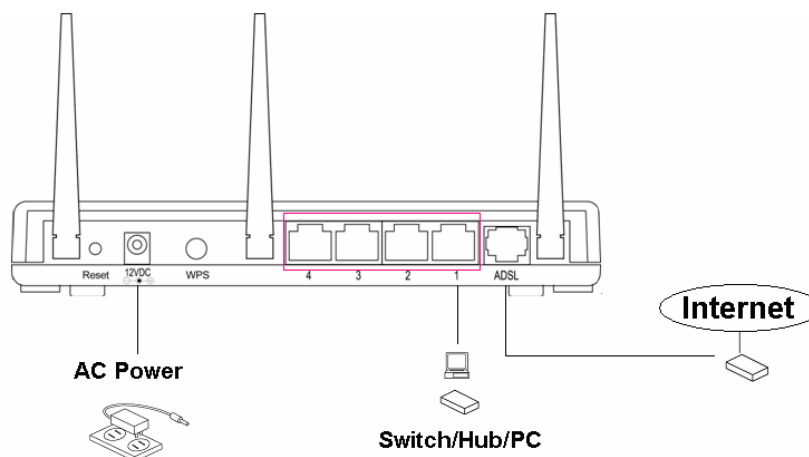
3. Connect the A/C power adapter to the wall socket, and then connect it to the 'Power' socket of the router.

4. The ADSL LED will be ON if the router is connected to the ADSL cable and receives the ADSL signals successfully. If the LED is blinking, please contact with your ISP (Internet Service Provider) to check the problem.

3.2   Connecting to Web-Based Management

After the network connection is established, the next step is to setup the router with proper network parameters for the user's network environment.

Before connecting to the router and start configuration procedures, user's computer must be able to get an IP address automatically (use dynamic IP address). If the PC is set to 'static IP address', then follow instructions below to reconfigure it to 'dynamic IP address'.

3.2.1 IP Address Configuration

a) **Windows 95/98/Me**

1. Click the Start button and select **<Settings>**, then click **<Control Panel>**. The Control Panel window will appear.
2. Double-click on **<Network>** icon. The Network window will appear.

3. Check the list of Network Components. If TCP/IP is not installed, click the **<Add>** button to install it. If TCP/IP is installed, go to step 6.
4. In the Network Component Type dialog box, select **<Protocol>** and click **<Add>** button.
5. In the Select Network Protocol dialog box, select **<Microsoft>** and **<TCP/IP>** then click the **<OK>** button to start installing the TCP/IP protocol. Windows CD may be needed to complete the installation.
6. After installing TCP/IP, go back to the Network dialog box. Select **<TCP/IP>** from the list of Network Components and then click the <Properties> button.
7. Check each of the tabs and verify the following settings:
   - Bindings: Check Client for Microsoft Networks and File and printer sharing for Microsoft Networks.
   - Gateway: All fields are blank.
   - DNS Configuration: Select Disable DNS.
   - WINS Configuration: Select Disable WINS Resolution.
   - IP Address: Select Obtain IP address automatically.
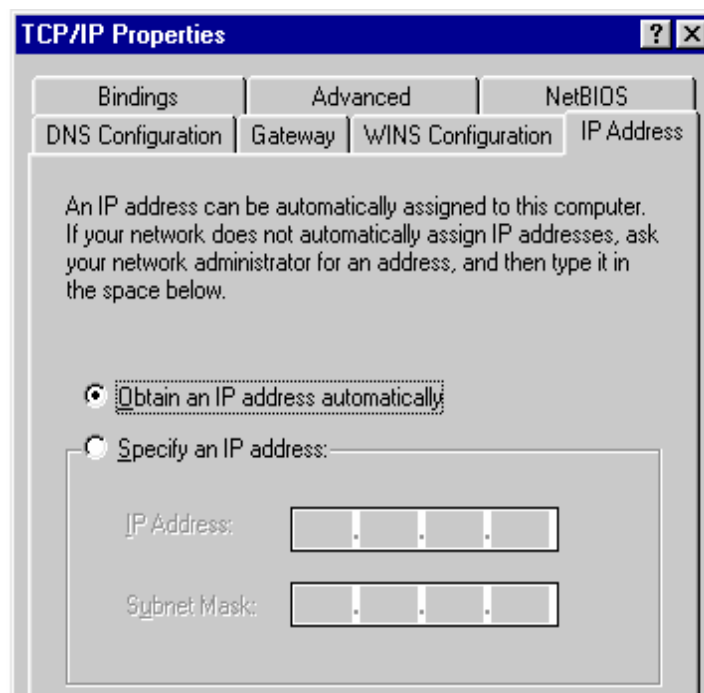
8. Reboot the PC. PC will now obtain an IP address automatically from the Broadband Router's DHCP server.
9. Please make sure that the Broadband router's DHCP server is the only DHCP server available on the LAN network.
10. Proceed to Web-based User Interface once IP address is correctly configured.

b) Windows 2000

1. Click the **<Start>** button and select **<Settings>**, then click **<Control Panel>**. The Control Panel window will appear.
2. Double-click **<Network and Dial-up Connections>** icon. In the Network and Dial-up Connection window, double-click on <Local Area Connection> icon. The Local Area Connection window will appear.
3. In the Local Area Connection window, click the **<Properties>** button.
4. Check the list of Network Components. Users should see Internet Protocol [TCP/IP] on the list. Select it and click the **<Properties>** button.
5. In the Internet Protocol (TCP/IP) Properties window, select **<Obtain an IP address automatically>** and **<Obtain DNS server address automatically>** as shown on the following screen.
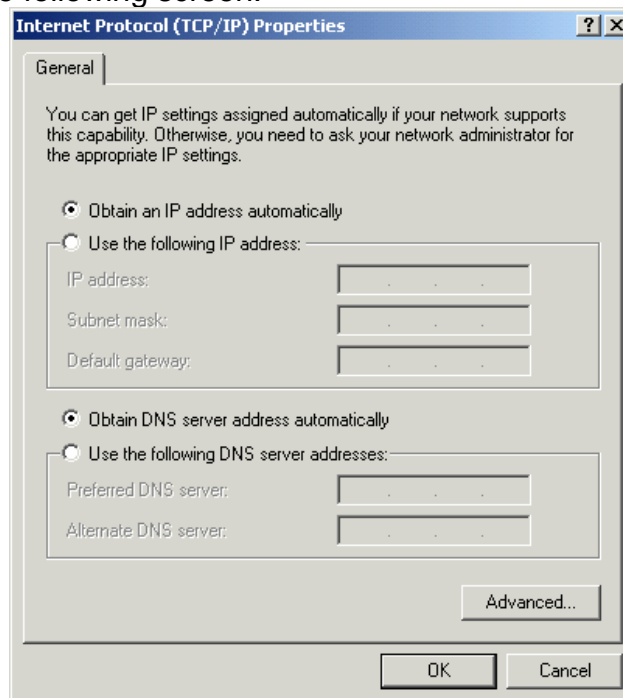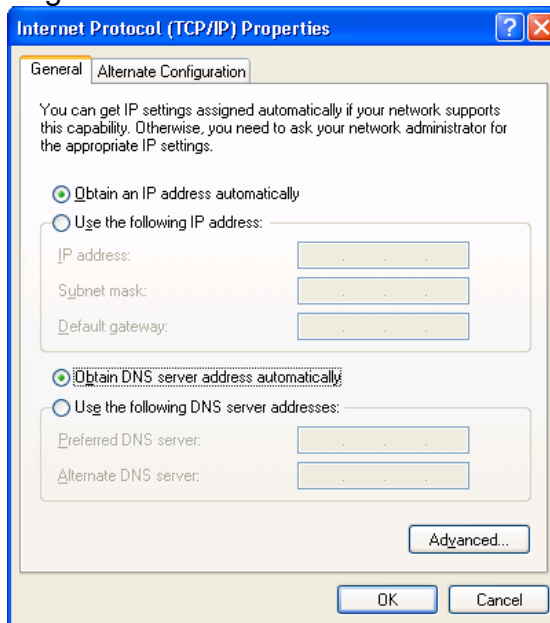

6. Click **<OK>** to confirm the setting. The PC will now obtain an IP address automatically from the Broadband Router's DHCP server.
7. Please make sure that the Broadband router's DHCP server is the only DHCP server available on the LAN network.
8. Proceed to Web-based User Interface once IP address is correctly configured.

c) Windows XP

1. Click the **<Start>** button and select **<Settings>**, then click **<Network Connections>**. The Network connections window will appear.

2. Double-click **\<Local Area Connection>** icon. The Local Area Connection window will appear.
3. Check the list of Network Components. Users should see Internet Protocol [TCP/IP] on the list. Select it and click the **\<Properties>** button.
4. In the Internet Protocol (TCP/IP) Properties window, select **\<Obtain an IP address automatically>** and **\<Obtain DNS server address automatically>** as shown on the following screen.
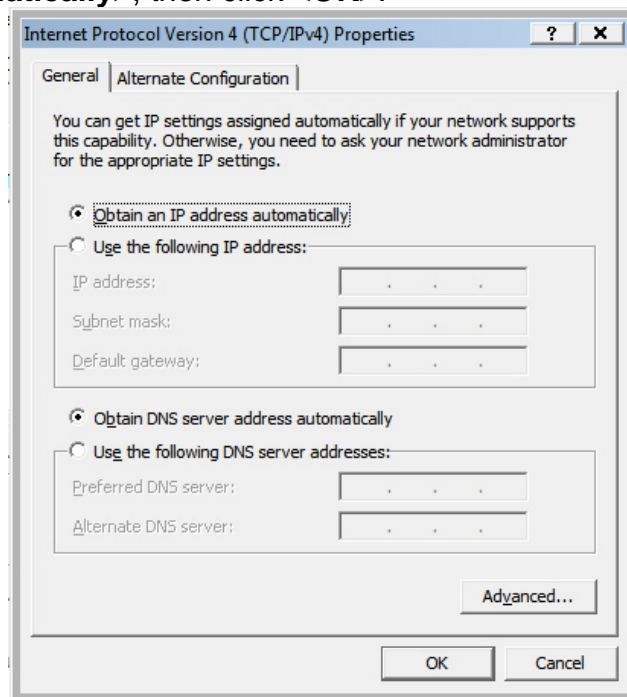

5. Click **\<OK>** to confirm the setting. PC will now obtain an IP address automatically from the Broadband Router's DHCP server.
6. Please make sure that the Broadband router's DHCP server is the only DHCP server available on the LAN network.

d) Windows Vista
1. Click **\<Start>** button, then click control panel. Click **\<View Network Status and Tasks>**, then click **\<Manage Network Connections>**. Right-click **\<Local Area Network>**, then select **\<Properties>**. Local Area Connection Properties window will appear, select **\<Internet Protocol Version 4 (TCP / IPv4)>** and click **\<Properties>**.
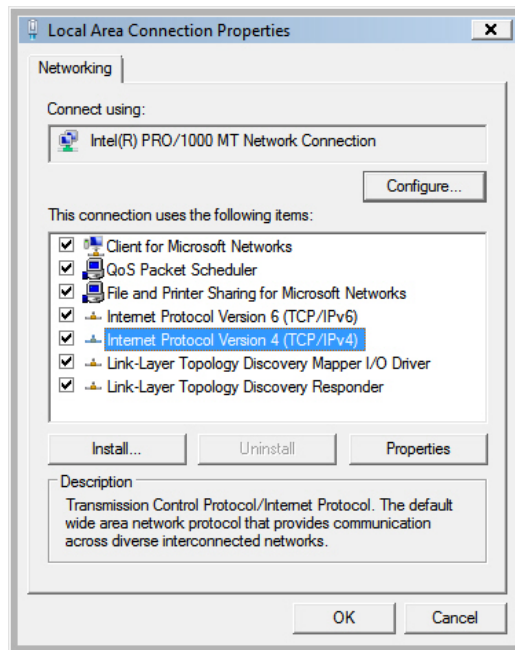
2. Select **<Obtain an IP address automatically>** and **<Obtain DNS server address automatically>**, then click **<OK>**.
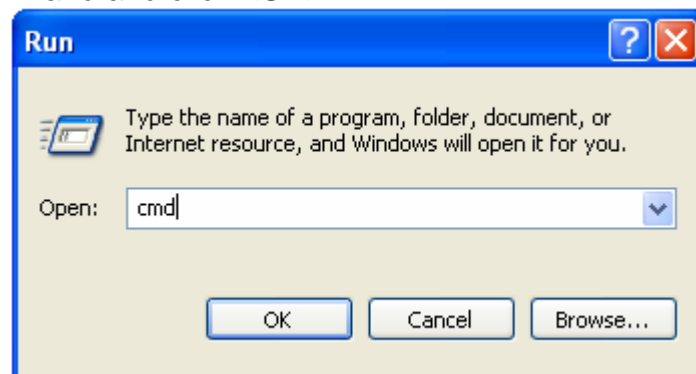

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3.2.2 Router's IP Address

1. After the IP address setup is complete, please click **<Start>** then **<Run>** at the
    bottom lower corner of the desktop.

2. Enter 'cmd' command and click **<OK>**.

3. Input 'ipconfig', then press 'Enter' key. Please check the IP address followed by
    'Default Gateway' (In this example, the IP address of router is 192.168.2.1, please
    note that this value may be different).

3.2.3 Starting Web-Based Management UI

1. After the computer has obtained an IP address from router, please start the web browser. Input the IP address of router in the address bar and the following message should appear:


2. Please input username and password in the field respectively. Default username is 'admin' and default password is '1234', then press **<OK>** button. Once the login details are entered correctly, users can see the web management interface of this router.

Chapter 4   Web-Based Management UI

4.1   Quick Start Wizard

The Quick Start section is designed to get the broadband router running as quickly as possible. In the Quick Start, users are required to fill in only the information necessary to access the Internet. Once user clicks on the **<Quick Start>** and click on **<Run Wizard>**, the following screen will appear.
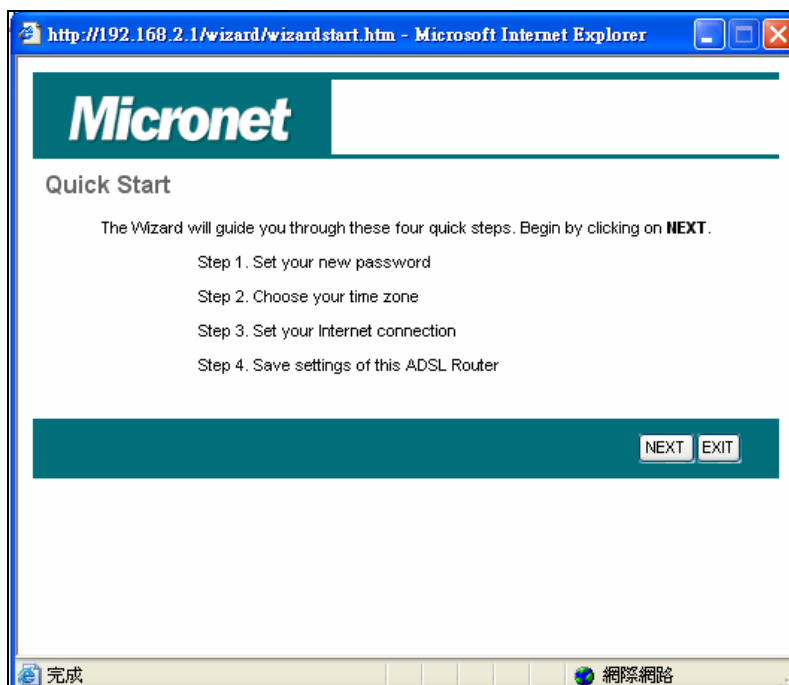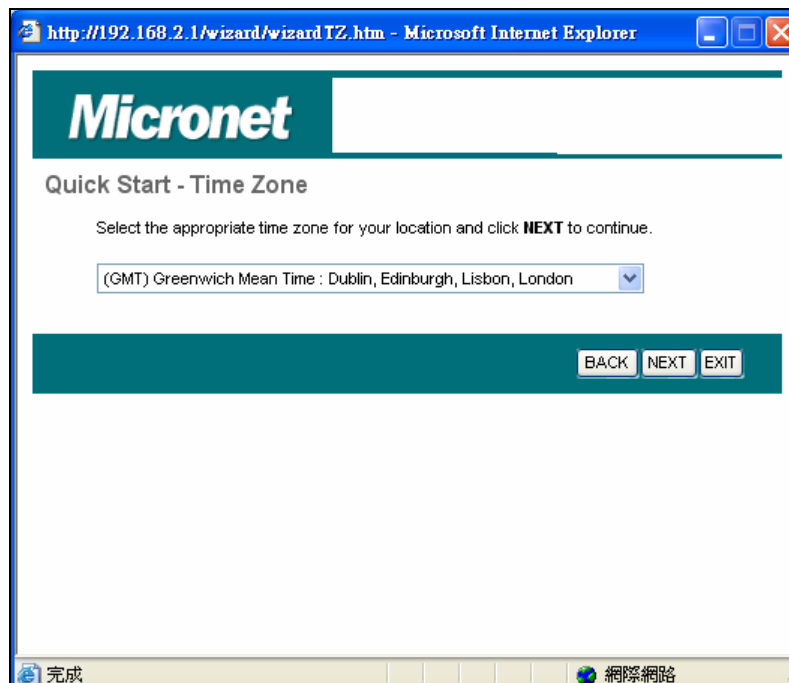

Step1: Set User Password

Please enter the new password and confirm the password again.
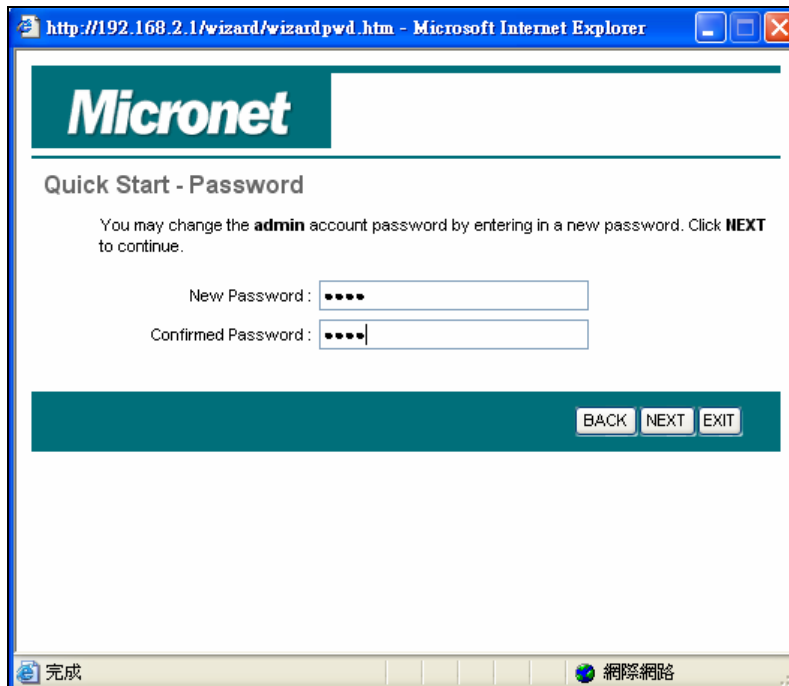
Step 2: Time Zone

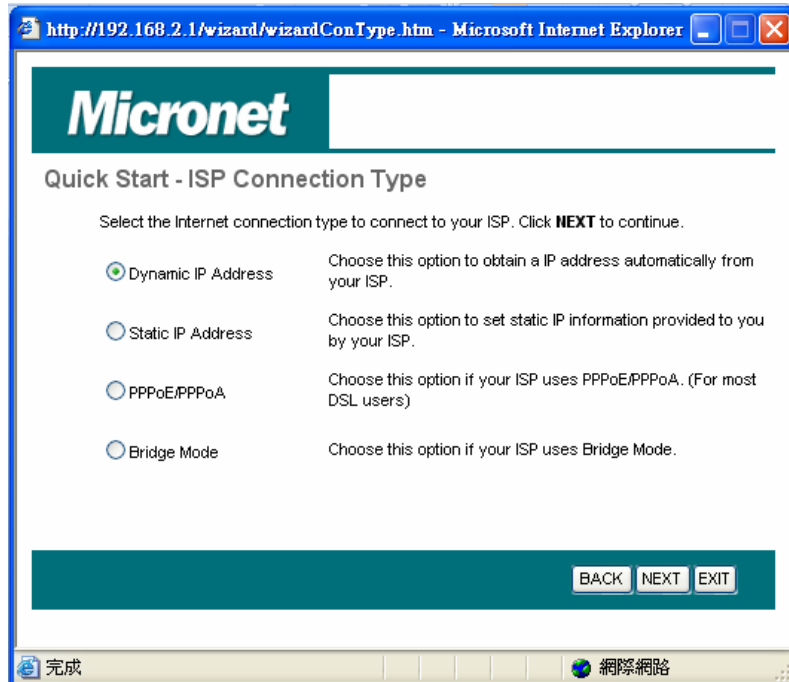The Time Zone allows router to base its time on the settings configured in this section.

Click on <NEXT> to proceed to the next page: Broadband Type.

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Step 3: Broadband Type

In this section users have to select one of four types of connections that it will be using to connect to broadband router WAN port to the ISP (see screen below). Different ISPs require different methods of connecting to the Internet, please check with the ISP as to the type of connection it requires.
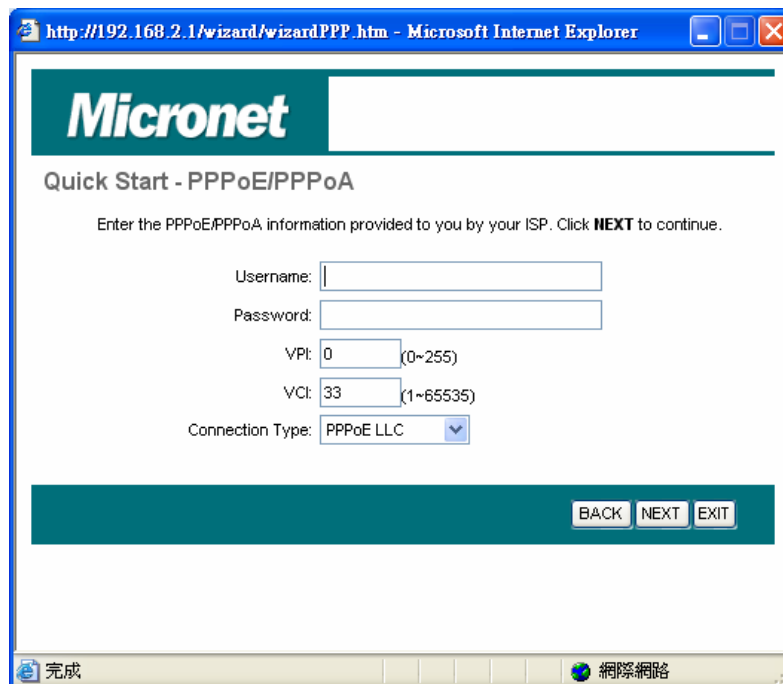

Parameter	Description
Dynamic IP Address	ISP will automatically provide an IP address.
Static IP Address	ISP has given users an IP address already.
PPPoE/PPPoA	PPPoE (PPP over Ethernet) and PPPoA (PPP over ATM) are common connection methods used for xDSL.
Bridge Mode	Device will act as modem only equipment to prevent conflict with other routers.

Click on one of the WAN type and then proceed to the manual's relevant sub-section.
*Click on **<Back>** to return to the previous screen.*

Step 4 Enter the Internet account details provided by ISP

Click <Next> to complete the Quick Start Wizard and restart modem router.

4.2   Interface Setup

4.2.1 Internet

Below interface is for entering all parameters in regards to connecting to ISP devices for Internet. Please consult below tables for detail description of each parameter.

ATM VC

Parameter	Description
Virtual Circuit	VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier define a virtual circuit.
VPI	VPI is a virtual path determines the way an ATM cell should be routed. The VPI is an 8-bit (in UNI) or 12-bit (in NNI) number that is included in the header of an ATM cell. The valid range for the VPI is 0 to 255. Enter the VPI assigned by the ISP.
VCI	VCI is the label given to an ATM VC to identify it and determine its destination. The VCI is a 16-bit number that is included in the header of an ATM cell. The valid range for the VCI is 32 to 65535. Enter the VCI assigned by the ISP.

ATM QoS	**CBR (Constant Bit Rate)** – This class is used for emulating circuit switching. The cell rate is constant with time. Select CBR to specify fixed (always on) bandwidth for voice or data traffic. **UBR (Unspecified Bit Rate)** – Select UBR for applications that are non-time sensitive, such as e-mail. **rtVBR (real time Variable Bit Rate)** – This class is similar to nrtVBR but is designed for applications that are sensitive to cell-delay variation. Examples for real-time VBR are voice with speech activity detection (SAD) and interactive compressed video. **nrtVBR (non-real time Variable Bit Rate)** – This class allows users to send traffic at a rate that varies with time depending on the availability of user information. Statistical multiplexing is provided to make optimum use of network resources. Multimedia e-mail is an example of nrtVBR.
PCR	Divide the DSL line rate (bps) by 424 (the size of an ATM cell) to find the PCR (Peak Cell Rate). This is the maximum rate at which the sender can send cells.
SCR	SCR (Sustain Cell Rate) is the average rate, as measured over a long interval, in the order of the connection lifetime.
MBS	MBS (Maximum Burst Size) refers to the maximum number of cells that can be sent at the peak rate. Type the MBS, which is less than 65535.

Encapsulation

The router can be connected to your service provider in any of the following ways.

Parameter	Description
Dynamic IP Address	ISP will automatically provide an IP address.
Static IP Address	ISP has given users an IP address already.
PPPoE/PPPoA	PPPoE (PPP over Ethernet) and PPPoA (PPP over ATM) are common connection methods used for xDSL.
Bridge Mode	Device will act as modem only equipment to prevent conflict with other routers.

Dynamic IP Address/Static IP Address/PPPoE/PPPoA/Bridge Mode

After you have selected the ISP Type, this web page will be varied depending on the ISP Type you select. Please refer to the following table for the explanation of each parameter.

Parameter	Description
Service Name	Enter the name of your ISP.
User Name	Enter the username exactly as your ISP assigned.
Password	Enter the password that your ISP has assigned to you.
Encapsulation	Please check with your ISP the method of multiplexing. In Bridge Mode, please select "1483 Bridge IP LLC" or "1483 Bridge IP VC-Mux". In PPPoE/PPPoA mode, please select "PPPoE LLC", "PPPoE VC-Mux", "PPPoA LLC", or "PPPoA VC-Mux".
Bridge Interface	This router has built-in ADSL modem and is able to connect to ISP directly. Alternatively, if you want to use the dial up software to manually connect to the ISP, you have to activate the"Bridge Interface".
Connection	**Always On** – The connection will be kept always on. If the connection is interrupted, the router will re-connect automatically. **Connect On-Demand** – Only connect when you want to surf the Internet. "Close if idle for xx minutes" is set to stop the connection when the network traffic is not sending or receiving after an idle time. **Connect Manually** – After you have selected this option, please go to Status page. You will see the "Connect" button, click it and the router will connect to the ISP. If you want to stop the connection, please click "Disconnect" button.
TCP MSS Option	The "TCP MSS Option" enables the configuration of the maximum segment size (MSS) for transient packets that traverse a router, specifically TCP segments in the SYN bit set, when PPPoE is being used in the network. Please specify the MSS range from 100 to 1452 bytes or 0 byte as the default value.
Get IP Address	Choose Static or Dynamic IP Address. If Static IP is selected, please set the IP Address, Subnet Mask and Gateway obtained from your ISP.
Static IP Address	Enter the IP Address assigned by your ISP.
IP Subnet Mask	Enter the Subnet Mask assigned by your ISP.
Gateway	Enter the Gateway assigned by your ISP.
NAT	NAT (Network Address Translation), an Internet standard that enables a local-area network (LAN) to use one set of IP addresses for internal traffic and a second set of addresses for external traffic. When NAT is enabled, the router will help to make all necessary IP address translations for the PC connected to the router to access the Internet.
Default Route	When "Default Router" is enabled, all the packets for destinations not known by the router's routing table are sent to the default route. By default, it is enabled.
TCP MTU Option	MTU (Maximum Transmission Unit) determine the maximum size of each packet in any transmission within the network. Please specify the MTU range from 100 to 1500 bytes or 0 byte as the default value.

Dynamic Route	Dynamic routing allows routing tables in routers to change as the possible routes change. This router supports RIP1, RIP2-B and RIP2-M protocols for dynamic routing. After the RIP protocol is selected, please choose the RIP direction from "None", "Both", "IN Only" or "OUT Only".
Multicast	Specify the method of transmitting data simultaneously to many receivers. Please select "IGMP v1" or "IGMP v2" as the multicast protocol or select "Disabled" to disable the function.
MAC Spoofing	Once your ISP service requires identifying the MAC address of the devices. You can enable MAC Spoofing function and enter the valid MAC address, it allows you to change the MAC address of the router in order to access to the Internet service.

4.2.2 LAN

Router Local IP

Parameter	Description
IP Address	Enter the IP Address of the ADSL router for the local user to access the router's web page. By default, the IP Address is 192.168.2.1.
IP Subnet Mask	Enter the Subnet Mask of the ADSL router. By default, the Subnet Mask is 255.255.255.0.

Parameter	Description
Dynamic Route	Dynamic routing allows routing tables in routers to change as the possible routes change. This router supports RIP1, RIP2-B and RIP2-M protocols for dynamic routing. After the RIP protocol is selected, please choose the RIP direction from "None", "Both", "IN Only" or "OUT Only".
Multicast	Specify the method of transmitting data simultaneously to many receivers. Please select "IGMP v1" or "IGMP v2" as the multicast protocol or select "Disabled" to disable the function.
IGMP Snoop	When "IGMP Snoop" (Internet Group Management Protocol Snoop) is enabled, the router can make intelligent multicast forwarding decisions by examining the contents of each frame's IP header. Without the function, the router will broadcast the multicast packets to each port and may create excessive traffic on the network and degrade the performance of the network.

DHCP

Parameter	Description
DHCP	Users can enable or disable the DHCP server. By enabling the DHCP server the router will automatically give LAN clients an IP address. If the DHCP is not enabled then you'll have to manually set your LAN client's IP addresses.
Starting IP Address	If the DHCP Server is enabled, please set the "Starting IP Address" which will be the first IP Address assigned to the LAN client. By default, the "Starting IP Address" is 192.168.2.100.
IP Pool Count	Users can select a particular IP address range for your DHCP server to issue IP addresses to your LAN Clients. By default, the "IP Pool Count" is 100. The IP range is starting from IP 192.168.2.100 to 192.168.2.199.
Lease Time	In the Lease Time setting you can specify the time period that the DHCP Server lends an IP address to your LAN clients. The DHCP will change the LAN client's IP address when this time threshold period is terminated.
DNS Relay	A Domain Name System (DNS) server is like an index of IP addresses and Web addresses. If users type a Web address into your browser, such as "www.router.com", a DNS server will find that name in its index and the matching IP address. Please select "Use Auto Discovered DNS Server Only" to auto set the DNS Server. If there is a DNS server that you would rather use, please select "Use Discovered DNS Server Only" and you need to specify the IP address of that DNS server.
Primary DNS Server	Enter the ISP's DNS Server IP Address; or user can specify preferred DNS Server IP Address.
Secondary DNS Server	This is optional. Users can enter another DNS Server's IP Address as a backup. The secondary DNS will be used if the Primary DNS fail.

4.2.3 Wireless

Access Point Settings

Parameter	Description
Access Point	Activated or deactivated the wireless function of the router. When it is activated, the router will be an access point for other wireless clients to connect wirelessly.
Channel	It is the radio channel used by the wireless LAN. All devices in the same wireless LAN should use the same channel. Please select the country you are located and designate a channel that the router will use. For product available in the USA/Canada market, only channel 1~11 can be operated. For product in Europe market, only channel 1~13 can be selected. Selection of other channels is not permitted. If you want to let the router automatically find an available channel with the highest signal strength, please select "Auto". The auto-selective channel will be shown in the "Current Channel" field.
Beacon Interval	The interval of time that this wireless router broadcast a beacon. Beacon is used to synchronize the wireless network. The range for the beacon period is between 20 and 1000 with a typical value of 100 (milliseconds).
RTS/CTS Threshold	When the packet size is smaller than the RTS threshold, the wireless router will not use the RTS/CTS mechanism to send this packet. The range is from 1500 to 2347.
Fragmentation Threshold	Fragment Threshold specifies the maximum size of packet during the fragmentation of data to be transmitted. If you set this value too low, it will result in bad performance. Enter a value from 256 to 2346.

Parameter	Description
DTIM	Determines the interval the Access Point will send its broadcast traffic. The range is from 1 to 255 and the default value is 3 beacons.
Wireless Mode	**802.11b** – It only allows 802.11b wireless network client to connect to this router (maximum transfer rate 11Mbps). **802.11g** – It only allows 802.11g wireless network client to connect to this router (maximum transfer rate 54Mbps). **802.11b+g** – It only allows 802.11b and 802.11g wireless network client to connect to this router (maximum transfer rate 11Mbps for 802.11b clients, and maximum 54Mbps for 802.11g clients). **802.11n** – It only allows 802.11n wireless network client to connect to this router (maximum transfer rate 300Mbps). **802.11g+n** – It allows 802.11g, and 802.11n wireless network client to connect to this router (maximum transfer rate 54Mbps for 802.11g clients, and maximum 300Mbps for 802.11n clients). **802.11b+g+n** – It allows 802.11b, 802.11g, and 802.11n wireless network client to connect to this router (maximum transfer rate 11Mbps for 802.11b clients, maximum 54Mbps for 802.11g clients, and maximum 300Mbps for 802.11n clients). **NOTE:** For 802.11b and 802.11g mode, the signals can be transmitted only by antenna 1 (The antenna in the right side of the rear panel). For 802.11n mode, the router is operating in a 2T3R Spatial Multiplexing MIMO configuration. 2 antennas are for signal transmitting and 3 antennas are for signal receiving.

11n Settings

Parameter	Description
Channel Bandwidth	Set channel width of wireless radio. Do not modify default value if you don't know what it is, default setting is '20/40 MHz'.
Extension Channel	Select the extension channel to above or below the control channel while 40MHz channel bandwidth is selected. Do not modify the default value if you don't know what it is.
Guard Interval	It is one of several draft-n features designed to improve efficiency. Select 400nsec to provide a shorter delay between transmission frames in 11n network. The throughput in 400nec guard interval is better than 800nsec guard interval.
MCS	Select MCS 0-15 to configure the data rate of 11n network. When MCS 15 is selected, the data rate is up to 300Mbps. It is recommended to set "Auto" and the router will negotiate with wireless clients to operate in a proper data rate.
SSID Index	This router can support multiple SSIDs. By default, this function is disabled.

Broadcast SSID	Select "Yes" to make the SSID to be visible so wireless clients can scan the router within the network. Select "No" if you want to hide the SSID of the router. Wireless clients have to set the same SSID of the router in order to access the network.
WMM	The short of Wi-Fi Multi Media, it will enhance the data transfer performance of multimedia contents when they're being transferred over wireless network.
Use WPS	Select "Yes" to enable WPS function, Select "No" to disable WPS.

WPS Settings

Wi-Fi Protected Setup (WPS) is the simplest way to build connection between wireless network clients and this router. Users do not have to select encryption mode and input a long encryption passphrase every time, they only have to press a button on wireless client and this wireless router to allow WPS complete the setup.

This router supports two types of WPS: Push-Button Configuration (PBC), and PIN code. If users want to use PBC, they have to switch this wireless router to WPS mode and push a specific button on the wireless client to start WPS mode. Users can push Reset/WPS button of this router, or select "PBC" and click "Start WPS" button in the WPS setup page. If users want to use PIN code, they have to know the PIN code of wireless client and switch it to WPS mode, then set the PIN code of the wireless client to this router in the WPS setup page and click "Start WPS" button.

Parameter	Description
Enrollee PIN Code	Enter the PIN code of the wireless client here. If you have entered the PIN code of the wireless client and switch to the WPS mode, the security settings of the wireless client will be set to the same as the router.
WPS progress	Display the progress during WPS communication.
Reset to OOB	Click this button and all the wireless settings of the router will be reset to factory defaults.
SSID	The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs. The default SSID of the router is "default".

Authentication Type	It's very important to set wireless security settings properly. If not enabled, hackers and malicious users can reach your network and valuable data without user's consent and this will cause serious security problem. This router supports WEP, WPA-PSK and WPA2-PSK authentication type. If the router has enabled the authentication, all the wireless clients' settings have to be consistent with the router for building the connection.

WEP/WPA-PSK/WPA2-PSK & WPA-PSK/WPA2-PSK

Parameter	Description
WEP-64Bits	WEP is less level of security than WPA. WEP supports 64-bit and 128-bit key lengths to encrypt the wireless data. The longer key length will provide higher security. When "WEP-64Bits" is selected, you have to enter exactly 5 ASCII characters ("a-z" and "0-9") or 10 hexadecimal digits ("0-9", "a-f") for each Key (1-4).
WEP-128Bits	When "WEP-128Bits" is selected, you have to enter exactly 13 ASCII characters ("a-z" and "0-9") or 26 hexadecimal digits ("0-9", "a-f") for each Key (1-4).
WPA-PSK	WPA-PSK is suitable for home and small business. It uses TKIP or AES for data encryption. When "WPA-PSK" is selected, please select the encryption method and enter 8-63 ASCII characters or 64 hexadecimal characters as the "Pre-Shared Key".
WPA2-PSK	WPA2-PSK is also for home and small business. It uses TKIP or AES for data encryption. WPA2-PSK offers the highest level of security available. When "WPA2-PSK" is selected, please select the encryption method and enter 8-63 ASCII characters or 64 hexadecimal characters as the "Pre-Shared Key".
WPA-PSK/ WPA2-PSK	When "WPA-PSK/WPA2-PSK" is selected, please select the encryption method (TKIP or AES) and enter 8-63 ASCII characters or 64 hexadecimal characters as the "Pre-Shared Key".

Wireless MAC Address Filter

Parameter	Description
Active	This router can prevent the wireless clients from accessing the wireless network by checking the MAC Address of the clients. If users enable this function, please set the MAC Address of the wireless clients to be filtered.
Action	**Allow Association** – Only allow the wireless clients with the MAC Address specified to access the router. **Deny Association** – The wireless clients with the MAC Address specified will be denied accessing to the router.
Mac Address #1-8	Please enter the MAC Address of the wireless clients for the filtering control.

4.3 Advanced Setup

4.3.1 Firewall

Parameter	Description
Firewall	When you enable the firewall function, it will protect you from following attacks of WAN side: ➢ SYN flooding attack ➢ Ping of Death ➢ Teardrop ➢ Land attack
SPI	If you enable SPI, all traffics initiated from WAN site will be blocked including DMZ, Virtual Server, etc.

4.3.2 Routing

Routing Table List

Users can see the current routing table of the router here. If they want to add another routing rule, please click "ADD ROUTE".

Parameter	Description
Dest IP	Show the IP Address of the destination LAN.
Mask	Show the Subnet Mask of the destination LAN. If it shows "8" that means the Subnet Mask is "255.0.0.0"; "16" means the Subnet Mask is "255.255.0.0"; "24" means the Subnet Mask is "255.255.255.0".
Gateway IP	The next stop gateway of the path toward the destination LAN. This is the IP of the neighbor router that this router should communicate with on the path to the destination LAN.
Metric	The number of hops (routers) to pass through to reach the destination LAN. It must be between 1 and 15.
Device	Show the interface that go to the next hop (router), such as LAN port.
Use	The counter for access time.
Edit	Edit the route, this icon is not shown for system default route.
Drop	Drop the route, this icon is not shown for system default route.

Add Route

If users have another router with a LAN-to-LAN connection, they may need to create a static routing on the router that is the gateway to Internet.

Parameter	Description
Destination IP Address	Enter the IP Address of the destination LAN.

IP Subnet Mask	Enter the Subnet Mask address of the destination LAN.
Gateway IP Address	This is the gateway IP Address where packets are sent. Enter the gateway IP Address and select the channel (PVC) you want to configure.
Metric	The number of hops (routers) to pass through to reach the destination LAN. It must be between 1 and 15.
Announced in RIP	Select "Yes", this routing path will be propagated to other hosts through RIP broadcasts. Select "No", this routing path will be kept private and it is not included in RIP broadcasts.

4.3.3 NAT

Network Address Translation (NAT) allows multiple users at your local site to access the Internet through a single Public IP Address or multiple Public IP Addresses. NAT provides Firewall protection from hacker attacks and has the flexibility to allow you to map Private IP Addresses to Public IP Addresses for key services such as Websites and FTP.
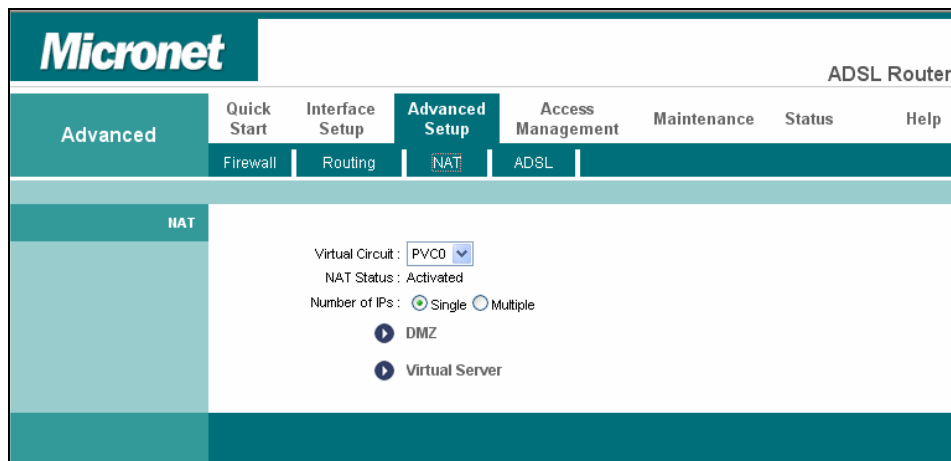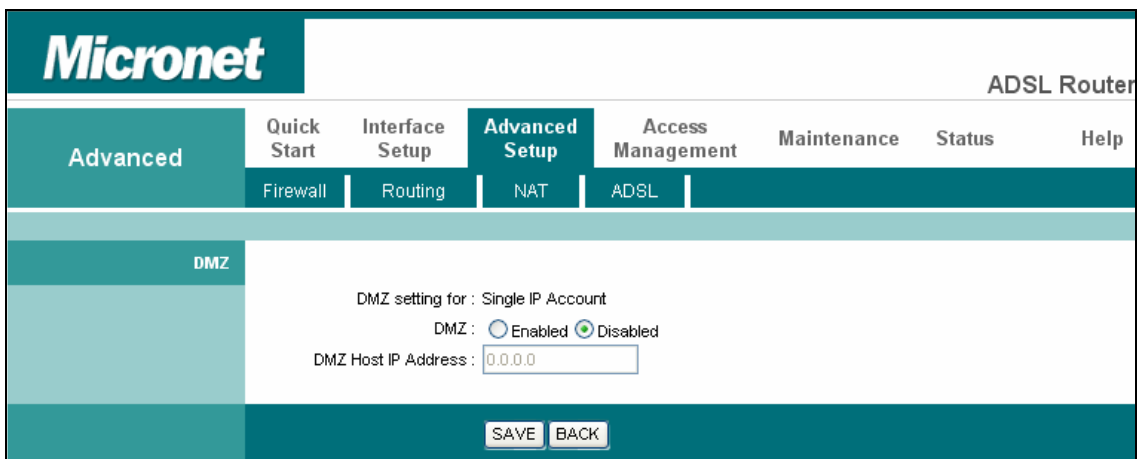
Parameter	Description
Virtual Circuit	Please select the channel (PVC) you want to configure.
NAT Status	The activated or deactivated status for the NAT function will be shown here.
Number of IPs	Select "Single" if you only have a public IP Address. Select "Multiple" if you have multiple IP Addresses.

DMZ

The DMZ Host is a local computer exposed to the Internet. When setting a particular internal IP Address as the DMZ Host, all incoming packets will be checked by the firewall and NAT algorithms then passed to the DMZ Host.

For example, if you have a local client PC that cannot run an Internet application (e.g. Games) properly from behind the NAT firewall, then you can open the client up to unrestricted two-way Internet access by defining a DMZ Host.

Parameter	Description
DMZ setting for	Show the DMZ setting is for single or multiple IP Addresses.
DMZ	Enable or disable the DMZ function.
DMZ Host IP Address	Enter a static IP Address to the DMZ Host. This IP Address will be exposed to the Internet.

Virtual Server

Use the Virtual Server function when you want different servers/clients in your LAN to handle different service/Internet application type (e.g. Email, FTP, Web server etc.) from the Internet. Computers use numbers called port numbers to recognize a particular service/Internet application type. The Virtual Server allows you to re-direct a particular service port number (from the Internet/WAN) to a particular LAN's private IP Address and its service port number.

Parameter	Description
Virtual Server for	Show the Virtual Server setting is for single or multiple IP Addresses.
Rule Index	Choose the rule number.
Application	Select the application of the virtual server, for example: FTP or HTTP Server. When the application is selected, the port number for the application will be assigned automatically.
Start Port Number	Enter the start port number.
End Port Number	Enter the end port number.
Local IP Address	It is recommended to enter a static IP Address for the server here. If the server's IP Address is obtained from DHCP Server, the IP Address may be changed dynamically and will cause problem in the feature. Please assign a static IP Address to the server and make sure that the IP Address is not in the range of IP Addresses that the DHCP Server will assign.

4.3.4 ADSL

Parameter	Description
ADSL Mode	The default setting is "Auto Sync-Up". This mode will automatically detect the ADSL mode including ADSL2+, ADSL2, G.DMT, T1.413 and G.lite. If you are not sure how to select the ADSL mode, please contact with your ISP.
ADSL Type	Check with your ISP about the ADSL type of the DSLAM device they use.

4.4   Access Management

4.4.1 ACL

If users want to restrict users from accessing certain Internet applications/services such as Internet websites, email, FTP etc., then this is the place to set that configuration. Access Control allows users to define the traffic type permitted in your LAN or WAN. Users can control which computer can have access to these services by entering the IP Address of the computer.

Parameter	Description
ACL	Activate or deactivate the Access Control function. When you have activated the function, please make sure that you have designated the available applications/services or you will be denied to access all the services.
ACL Rule Index	This is the item number to record the setting rule.
Secure IP Address	The default 0.0.0.0~0.0.0.0 allows any user to use this service to remotely manage the router. Type a range of IP Addresses to authorize access to a number of users with matching IP Addresses.
Application	Choose the services that you permit to use in your LAN or WAN interface. These services include Web, FTP, Telnet, SNMP and Ping.
Interface	Select the interface that the user is allowed to use services through it. It includes LAN, WAN or Both.

4.4.2 Filter

Users can forbid some users from accessing the router by filtering IP Address or MAC Address. Users can also restrict some applications or URLs be accessing by users through the router here. Please select the filter type to start configuring.

IP/ MAC Filter

IP/ MAC Filter Set Editing

Parameter	Description
IP/MAC Filter Set Index	This is the item number to record the setting.
Interface	Select which channel (PVC) to configure.
Direction	Select the access to the Internet (Outgoing) or from the Internet (Incoming), or Both.

IP / MAC Filter Rule Editing

Parameter	Description
IP/MAC Filter Rule Index	This is the item number to record the setting rule.
Rule Type	Select to filter through the IP Address or MAC Address.
Active	Select "Yes" to enable the current rule, select "No" to cancel the current rule.
Source IP Address	Enter the start IP Address which will be monitored. If "0.0.0.0" is set, it means for any IP Address.
Subnet Mask	Enter the Subnet Mask based on the Source IP Address.
Port Number	LAN users use port number to distinguish one network application over another such as 21 is for FTP service. The port number range is from 0 to 65535. It is recommended that this option be configured by an advanced user.
Destination IP Address	Enter the start IP Address which will be monitored. If "0.0.0.0" is set, it means for any IP Address.
Subnet Mask	Enter the Subnet Mask based on the Destination IP Address.
Port Number	This is the port or port ranges that define the application.
Protocol	It is the packet protocol type used by the application. Please select "TCP", "UDP" or "ICMP". For example, FTP service, you have to select "TCP".
Rule Unmatched	Select action for the traffic mismatching current rule. "Forward" is to leave it pass through. "Next" is to check it by the next rule.

Application Filter

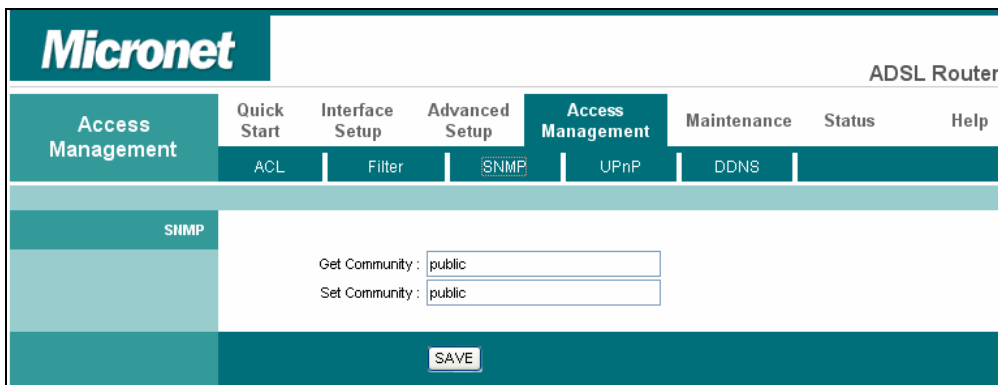| Parameter	Description
Application Filter	Activate or deactivate the application filter.
ICQ/MSN/YMSG/ Real Audio/Video	If "Allow" is selected, the packets for these applications will be able to pass through the router. If you want to restrict these applications, please select "Deny".

URL Filter

Parameter	Description
Active	Activate or deactivate the URL filter.
URL Index	This is the item number to record the setting.

URL	A URL can be thought of as the "address" of a web page and is sometimes referred to informally as a "web address." Please enter the web address here that you want to restrict to be connected.

4.4.3 SNMP

Simple Network Management Protocol (SNMP) is a popular protocol for network management. It is used for collecting information and configuring the network devices. This router supports SNMP agent function, which allows a manager station to manage and monitor the router through the network.

Parameter	Description
Get Community	Enter the password for the incoming Get- and Get Next requests from the management station.
Set Community	Enter the password for a Set request to configure the router.

4.4.4 UPnP

When the UPnP function is enabled, the router can be detected by UPnP compliant system such as Windows XP. The router will be displayed in the Neighborhood of Windows XP, so you can directly double click the router or right click the router and select "Invoke" to configure the router through web browser.

Parameter	Description
UPnP	Activated or deactivated the UPnP function.
Auto-configured	Select this check box to allow UPnP-enabled applications to automatically configure the router so that they can communicate through the router, for example by using NAT traversal, UPnP applications automatically reserve a NAT forwarding port in order to communicate with another UPnP enabled device. This eliminates the need to manually configure port forwarding for the UPnP enabled application.

4.4.5 DDNS

DDNS allows you to map the static domain name to a dynamic IP address. You must get an account, password and your static domain name from the DDNS service providers.

Parameter	Description
Dynamic DNS	Activated or deactivated the DDNS function.
Service Provider	This router supports DynDNS service provider.
My Host Name	Enter the domain name assigned to your router by the service provider.
E-mail Address	Enter the E-mail address assigned by DDNS service provider.
Username	Enter your username.
Password	Enter the password you set for the DDNS service.
Wildcard Support	Enable or disable the wildcard to stand for some characters.

4.5 Maintenance

4.5.1 Administrator

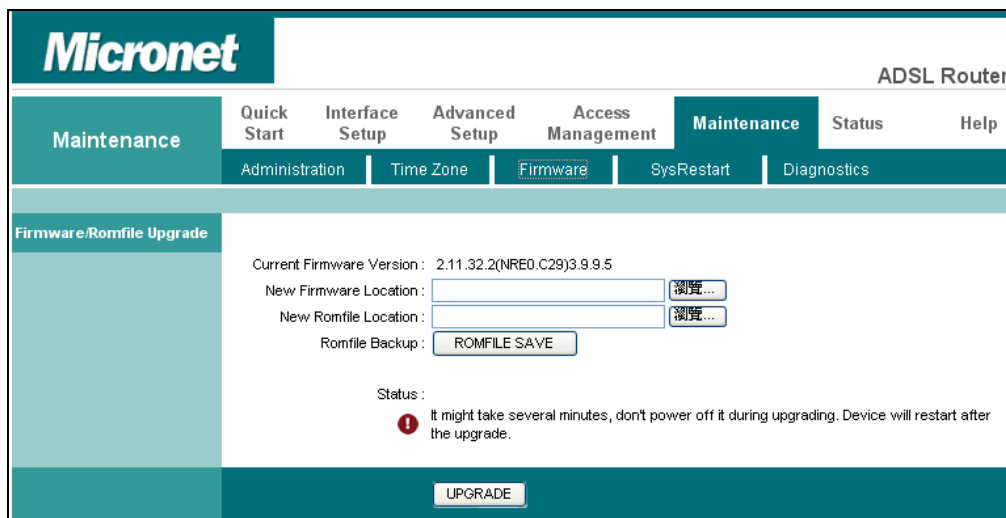| Parameter	Description
Username	The username of the router is "admin" by default.
New Password	Enter up to 30-digit for the new password.
Confirm Password	Enter the new password again to confirm the setting.

4.5.2 Time Zone

The Time Zone allows the router to set its time and this will affect function such as System Log.

Parameter	Description
Current Date/Time	Show the current date/time of the router.
Synchronize time with	**NTP Server Automatically** – Set the time automatically with a NTP Server. **PC's Clock** – Set the time synchronize with computer. **Manually** – Set the time manually.
Time Zone	Select the time zone of the country you are currently in. The router will set its time based on your selection.
Daylight Saving	Select this option if it is in daylight saving time.
NTP Server Address	Enter the IP Address of your time server.

4.5.3 Firmware

If users have new firmware for some features update, please upgrade firmware of the router in this section.

| Parameter	Description
Current Firmware Version	The current firmware version will be shown here.
New Firmware Location	Type in the location of the new firmware or click "Browse" to find it.
New Romfile Location	To restore the backup settings, please type in the location of the backup file or click "Browse" to locate.
Romfile Backup	To save the current settings as a backup file, please click "ROMFILE SAVE". Then please change the file name and select the location you want to save the file.
Upgrade	Click "Upgrade" to begin the upgrade processes or backup file restoring processes. After the router is restarted, the processes are completed. It might take several minutes, don't power off the router during upgrading or restoring.

4.5.4 System Restart

In this interface, users can restart the router or restore to factory defaults. If users wish to restart the router using the factory default settings, select "Factory Default Settings" to reset to factory defaults. Users can also click the "Reset" button in the rear panel of the router over 5 seconds to reset default settings.
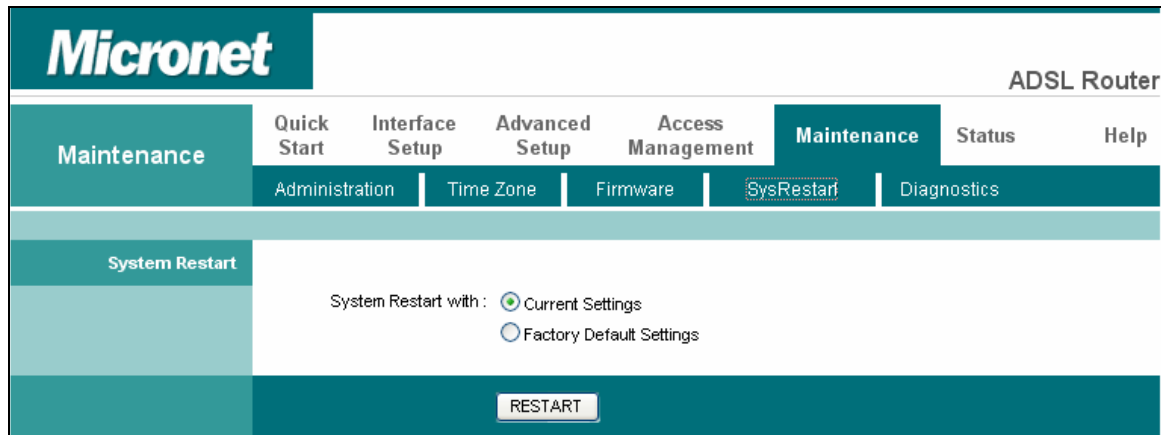
4.5.5 Diagnostics

This page allows user to diagnose the connectivity of the LAN and WAN network.
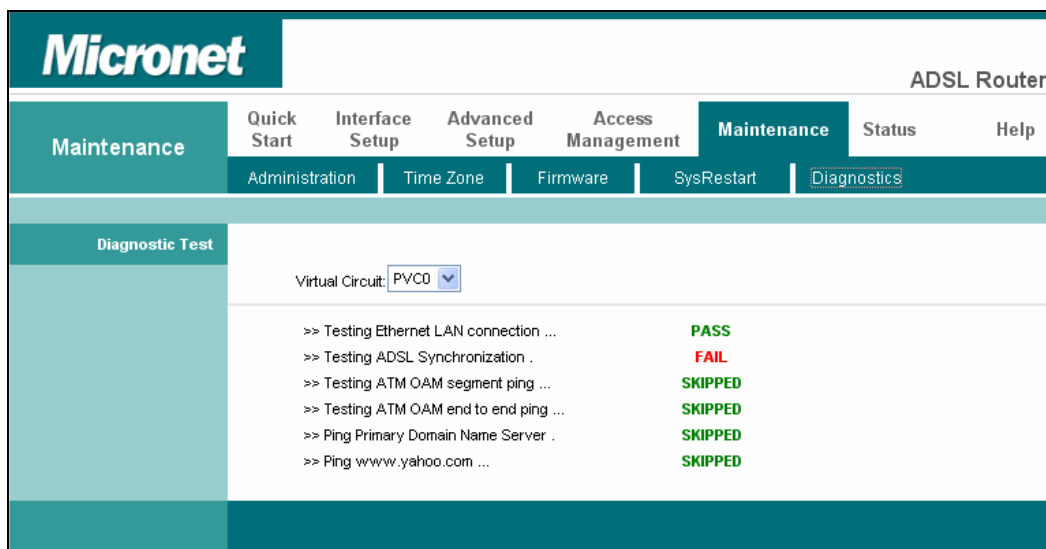
4.6　Status

4.6.1　Device Info

In this interface, it will show the device information including firmware, MAC Address, LAN and WAN settings and also the ADSL line status.

4.6.2　System Log

Display system logs accumulated up to the present time. You can also save the logs for future reviewing.

4.6.3 Statistics

Show the statistics of transmitted and received packets on the LAN port, ADSL line or WLAN port.

Chapter 5   Glossary

10Base-T

It is an Ethernet standard for Local Area Network (LAN). 10Base-T uses a twisted pair cable with maximum length of 100 meters.

AAL

ATM Adaptation Layer that defines the rules governing segmentation and reassembly of data into cells. Different AAL types are suited to different traffic classes.

ADSL

Asymmetric Digital Subscriber Line, as its name showing, is an asymmetrical data transmission technology with high traffic rate downstream and low traffic rate upstream. ADSL technology satisfies the bandwidth requirement of applications, which demand "asymmetric" traffic, such as web surfing, file download and Video-on-demand (VOD).

ATM

Asynchronous Transfer Mode is a layer 2 protocol supporting high-speed asynchronous data with advanced traffic management and quality of service features.

bps

Bits per second, a standard measurement of digital transmission speeds.

Bridge

Bridge is a device that connects multiple physical networks and forward packets between them. Bridges can usually be made to filter packets, that is, to forward only certain traffic. Related devices are: repeaters which simply forward electrical signals from one cable to the other and full-fledged routers which make routing decisions based on several criteria.

CPE

Customer Premises Equipment, such as ADSL router, USB modem.

Default Gateway (Router)

Every non-router IP device needs to configure a default gateway's IP address. When the device sends out an IP packet, if the destination is not on the same network, the device has to send the packet to its default gateway, which will then send it out towards the destination.

DHCP

Dynamic Host Configuration Protocol, this protocol automatically gives every computer on your home network an IP address.

DNS Server IP Address

DNS stands for Domain Name System, which allows Internet servers to have a domain name (such as www.Broadbandrouter.com) and one or more IP addresses (such as 192.34.45.8). A DNS server keeps a database of Internet servers and their respective domain names and IP addresses, so that when a domain name is requested (as in typing "Broadbandrouter.com" into your Internet browser), the user is sent to the proper IP address. The DNS server IP address used by the computers on your home network is the location of the DNS server your ISP has assigned to you.

DSL

Digital Line Subscriber (DSL) technology provides high-speed access over twisted copper pair for connection to the Internet, LAN interfaces, and to broadband services such as video-on-demand, distance learning, and video conferencing.

Ethernet

It is a standard for computer networks. Ethernet networks are connected by special cables and hubs or switches, and move data around at up to 10/100 million bits per second (Mbps).

FTP

File Transfer Protocol. The Internet protocol (and program) used to transfer files between hosts.

Idle Timeout

Idle Timeout is designed so that after there is no traffic to the Internet for a pre-configured amount of time, the connection will automatically be disconnected.

ISP

Internet Service Provider is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

ISP Gateway Address

The ISP Gateway Address is an IP address for the Internet router located at the ISP's office.

LAN

Local Area Network is a group of computers and devices connected together in a relatively small area (such as a house or an office). Your home network is considered a LAN.

MAC Address

MAC stands for Media Access Control. A MAC address is the hardware address of a device connected to a network. The MAC address is a unique identifier for a device with an Ethernet interface. It is comprised of two parts: 3 bytes of data that corresponds to the Manufacturer ID (unique for each manufacturer), plus 3 bytes that are often used as the product's serial number.

NAT

Network Address Translator is defined by RFC 1631. Enable a LAN network to use one set of IP address for internal traffic. A NAT box located where the LAN meets the Internet provides the necessary IP address translation. This helps provide a sort of firewall and allow for a wider address range to be used internally without danger of conflict. Using the router's NAT capability, you can access the Internet from any computer on your home network without having to purchase more IP addresses from your ISP.

Port

Network Clients (LAN PC) uses port numbers to distinguish one network application/protocol over another. Below is a list of common applications and protocol/port numbers:

Application	Protocol	Port Number
Telnet	TCP	23
FTP	TCP	21
SMTP	TCP	25
POP3	TCP	110
H.323	TCP	1720
SNMP	UCP	161
SNMP Trap	UDP	162
HTTP	TCP	80
PPTP	TCP	1723
PC Anywhere	TCP	5631
PC Anywhere	UDP	5632

PPP

PPP is the Point-to-Point-Protocol. The successor to SLIP, PPP provides router-to-router and host-to-network connections over both synchronous and asynchronous circuits.

PPPoA (RFC 2364)

The Point-to-Point Protocol (PPP) provides a standard method for transporting multi-protocol data grams over point-to-point links. This document describes the use of ATM Adaptation Layer 5 (AAL5) for framing PPP encapsulated packets.

PPPoE (RFC 2516)

This document describes how to build PPP sessions and encapsulate PPP packets over Ethernet. PPP over Ethernet (PPPoE) provides the ability to connect a network of hosts over a simple bridging access device to a remote Access Concentrator.

Protocol

A protocol is a set of rules for interaction agreed upon between multiple parties so that when they interface with each other based on such a protocol, the interpretation of their behavior is well defined and can be made objectively, without confusion or misunderstanding.

PVC

Permanent Virtual Circuit, connection-oriented permanent leased line circuit between end-stations on a network over a separate ATM circuit.

RFC

Request for Comments. The document (begun in 1969) is for describing the Internet suite of protocols and related experiments. Not all RFCs describe Internet standards, but all Internet standards are written up as RFCs.

RFC 1483

Multi-protocol encapsulation over AAL-5. Two encapsulation methods for carrying network interconnect traffic over ATM AAL-5. The first method allows multiplexing of multiple protocols over a single ATM virtual circuit. The protocol of a carried PDU is identified by prefixing the PDU by an IEEE 802.2 Logical Link Control (LLC) header. This method is in the following called "LLC Encapsulation". The second method does higher-layer protocol multiplexing implicitly by ATM Virtual Circuits (VCs). It is in the following called "VC Based Multiplexing".

Router

A system responsible for making decisions about which of several paths network (or Internet) traffic will follow. To do this, it uses a routing protocol to gain information about the network and algorithms to choose the best route based on several criteria known as "routing metrics.

Subnet Mask

A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers (e.g. 255.255.255.0) configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet, which must be assigned by InterNIC).

TCP/IP, UDP

Transmission Control Protocol/Internet Protocol (TCP/IP) and Unreliable Datagram Protocol (UDP). TCP/IP is the standard protocol for data transmission over the Internet. Both TCP and UDP are transport layer protocol. TCP performs proper error detection and error recovery, and thus is reliable. UDP on the other hand is not reliable. They both run on top of the IP (Internet Protocol), a network layer protocol.

TELNET

It is the virtual terminal protocol in the Internet suite of protocols. Allows users of one host to log into a remote host and act as normal terminal users of that host.

VCI

Virtual Circuit Identifier is part of the ATM cell header. A VCI is a tag indicating the channel over which a cell will travel. The VCI of a cell can be changed as it moves between switches via Signaling.

VPI

Virtual Path Identifier is part of the ATM cell header. A VPI is a pipe for a number of Virtual Circuits.

WAN

Wide Area Network is a network that connects computers located in geographically separate areas (e.g. different buildings, cities, countries). The Internet is a wide area network.

Web-based management Graphical User Interface (GUI)

Many devices support a graphical user interface that is based on the web browser. This means the user can use the familiar Netscape or Microsoft Internet Explorer to Control/configure or monitor the device being managed.